

CHAPTER 2

BEST MANAGEMENT PRACTICES (BMPs)

I. WHAT ARE BEST MANAGEMENT PRACTICES?

Best Management Practices (BMPs) are runoff control, soil stabilization or sediment control practices and management decisions. These conservation practices provide the most effective, economical, and practical means of preventing or reducing the amount of pollution generated by nonpoint sources to a level compatible with state and local water quality goals. The selection of an appropriate BMP will depend greatly upon the site conditions (land use, topography, slope, water table elevation, and geology). BMP selection must be site specific to assure proper operation and to prevent undesirable results such as the protection of surface waters while contaminating groundwaters.

Three basic options that can be used to deal with NPS pollution and assist in selecting BMPs are **prevention, treatment, and control**:

1. **Prevention** measures avoid water quality problems by reducing activities that cause NPS pollution. In this context, preventative measures can include controlling land uses, sequencing construction operations to avoid disturbances during wet weather and minimizing disturbed areas. Although the prevention option is the most desirable, it is not always feasible. Then you must look to some sort of treatment measure (BMP to abate NPS pollution).
2. **Treatment** measures involve the use of physical, chemical, or biological processes to reduce residual levels of NPS pollutants. Treatment systems would include measures like storage of stormwater (detention systems), use of diversions as collection systems, sediment basins to keep sediment from leaving the site, and other BMPs. Where preventative and treatment measures alone cannot achieve the desired reduction of NPS pollution or where existing activities are having substantial negative effects on water quality, control measures may be required.

3. **Control** measures are implemented largely in existing situations and in conjunction with other measures to abate NPS pollution. Control measures in this context involve things such as regulating schedules of stormwater facilities that manage the quantity and quality of discharges, routine inspection and maintenance schedules for treatment measures, and anti-litter ordinances.

II. DETERMINING BMP NEEDS

1. Erosion Control Guidelines

A prerequisite to reducing soil erosion and water quality and quantity problems is having public officials, developers, contractors, builders, and homeowners knowledgeable about potential sediment damages and acceptable control programs. Based on the National Pollution Discharge Elimination System (NPDES) states are implementing erosion, sediment, and stormwater control plans by adopting a regulatory approach. In Kentucky, some counties and/or urban areas in the most rapidly developing areas such as Lexington-Fayette County have adopted local guidelines requiring an erosion control and water management plan. Through the establishment of local erosion, sediment, and water management ordinances, BMPs and resource management systems are being installed.

2. Stormwater Permitting

Stormwater runoff from construction activities is one facet of water quality and quantity management that is being regulated on some construction sites through the U.S. Environmental Protection Agency (EPA). The stormwater permit program was enacted by Congress in 1987 in the amendment to Water Pollution Control Act - Section 402(p). In Kentucky, this program falls under the Kentucky Pollutant Discharge Elimination System (KPDES) permit program administered by the Kentucky Division of Water.

A. Determining the Need for a Stormwater Permit

The program presently applies only to those construction sites that will disturb five or more acres. The five-acre area includes long narrow projects such as buried pipelines/conduit/sewer construction if the construction easement width multiplied by the length would equal or exceed five acres. A recent court decision may force EPA, and subsequently the state, to modify the minimum size from five acres to a smaller area, possibly one acre.

The area of disturbance is defined as only that portion of the site where ground cover and/or topsoil is removed, as contrasted to areas where tree or shrub clearing is the only activity.

The definition of construction site applies equally to rural, suburban, or urban areas but does not include tilled agricultural fields.

B. Applying for a Stormwater Permit

General and individual permits are available. The Division of Water may require an individual permit in some cases; for instance, if the size, complexity, or threat to the environment of a project indicates the need for provisions other than those in the issued general permit, such as additional monitoring or limits. Individual permits are issued one at a time in response to separate, individual applications.

In most cases, the Kentucky Division of Water recommends applying for coverage under a stormwater general permit. A general permit provides coverage for nearly all facilities in the state. The state construction general permit was issued September 30, 1992. For sites requiring permitting, a Notice of Intent (NOI) letter is submitted requesting coverage under the general permit. The NOI can be processed more quickly and with fewer agency resources than can individual permits.

C. Submitting the NOI

The NOI should be submitted by the general contractor at least 48 hours prior to the construction. There are no forms for the NOI; it should be submitted on the general contractor's letterhead and should contain the following information.

- a. Name, mailing address, and location of the facility (construction site) for which the notification is submitted;
- b. Up to four-digit Standard Industrial Classification (SIC) codes that best represent the principal products for activities provided by the facility;
- c. The operator's name, address, telephone number, county, ownership status and status as federal, state, private, public, or other entity;
- d. The name of the receiving water(s), or if the discharge is through a municipal separate storm sewer, the name of the municipal operator of the storm sewer and the ultimate receiving water(s); and

- e. Existing quantitative data describing the concentration of pollutants in the stormwater discharge. If there are no existing quantitative data, report "no existing quantitative data."
- f. Additional Requirements for Construction Activities. The NOI for a stormwater discharge associated with industrial activity from a construction site shall, in addition to the information required above, include a brief description of the project, estimated timetable for major activities, estimates of the number of acres of the site on which soil will be disturbed, and a certification that the stormwater pollution prevention plan for the facility provides compliance with state or locally approved sediment and erosion plans, state or locally approved stormwater management plan, state or local sewer use ordinances, and state or local septic system requirements.

The NOI letter should be sent to:

Section Supervisor
Inventory and Data Management Section
KPDES Branch
Kentucky Division of Water
14 Reilly Road
Frankfort Office Park
Frankfort, Kentucky 40601

The applicant does not need to wait for a response from the agency; coverage becomes automatic within 48 hours of receipt of the NOI.

D. The Stormwater Pollution Prevention Plan

The construction general permit does not require runoff sampling, but there is a requirement for preparing and implementing a stormwater pollution prevention plan prior to start of construction. The plan should be available for review by the Division of Water upon site inspection, although it does not need to be submitted to or approved by the agency prior to permitting.

Periodic visual inspections by the owner and/or contractor are also required to verify that the erosion control plan is being followed and is working.

E. Permit Termination

Once construction is completed and a ground cover has been established so that erosion control measures are no longer necessary, the permit coverage itself is no longer needed. At that point, the original applicant submits a Notice of Termination (NOT) to the agency. (The general permit explains this process in more detail.)

For further information about stormwater permitting, contact Doug Allgeier or Jeff Hippe of the Kentucky Division of Water KPDES Branch (Industrial Section) at the above address or call (502) 564-3410.

3. Voluntary Approach

On sites less than five acres, state agencies and many local governments in Kentucky have opted for a non-regulatory educational approach. The voluntary use of BMPs on construction sites will aid greatly in the protection of the state's vital soil and water resources. By instituting an education program, part of which is exemplified by this BMP manual, the state is neither implying nor assuming that landusers are irresponsible in their land-disturbing activities. On the contrary, many land users learn more about conservation measures, as they see others using them. The lack of knowledge about these best management practices rather than any conscious neglect or rejection may be the case.

The educational program may be viewed as a form of communication. Information in this manual should improve discussion between land users (contractors, developers and homebuilders) and land stewards (local conservation district, planners, and other governmental officials). This cooperative and voluntary exchange of expertise will produce a better understanding of resource needs and problems, while fostering the voluntary implementation of best BMPs to protect these resources.

Contact your local conservation district for further information to determine the status regarding erosion control and/or stormwater management plans in your county.

CHAPTER 3

RESOURCE CONSERVATION PLANNING

I. SELECTING BMPs FOR TOTAL RESOURCE PLANNING

Cost effectiveness should always be a consideration in selecting appropriate BMPs for a specific construction site. Whether or not it is feasible to use a particular measure will be dependent upon how much it costs to install that measure in relation to the amount of pollution removal or stormwater runoff control the measure provides.

Determining cost effectiveness is not merely a comparison of costs of BMPs. Just because one practice costs less to implement does not necessarily mean that it is more cost effective if it must be maintained or replaced frequently. Another more expensive measure may, in fact, result in twice as much pollution abatement.

There are significant problems in deriving accurate and meaningful cost-effectiveness rating for BMPs. Each particular location will vary according to soil loss potential, water management, and erosion control costs. Some practices may be justified despite any cost-effectiveness evaluation (i.e., proper use of pesticides that will result in actual cost savings to the applicator - not to mention potential safeguards for water quality and public health). Additionally, some practices may be justified for other benefits provided, such as the aesthetic value of vegetation or its contribution to air quality or noise pollution abatement.

One of the most critical drawbacks in making a cost-effectiveness evaluation, however, is the fact that currently there is limited data to verify the pollution abatement potential of many practices. The studies that have been done conclude that in many instances the costs involved in water retention, in preventing erosion and in transport of sediment are lower than the costs of removing the same quantities of sediment from downstream areas.

1. Elements for Consideration for Cost Effectiveness

However, in most instances a single erosion control or water management practice is seldom used, normally a combination of BMPs is used. Several factors should be considered in evaluating the cost effectiveness of BMPs. These include:

- a. the environment in that erosion controls and water retention are to be used (including climate, topography, difficulty of access, etc.);
- b. length of time for that protection is needed;
- c. estimated soil loss and sediment yield from a particular site;
- d. combination of proposed BMPs;

- e. costs for materials, labor and overhead for installing each practice;
- f. damages and/or costs of removing sediment from storm sewers, and waterways;
- g. improvement in aesthetics and public relations;
- h. ability to sell or use property for desired intention;
- i. reducing initial expense of development that increases marketability and property values and;
- j. reduce costs of imported topsoil and cleanup of surrounding public/private properties;
- k. environmental and aesthetic benefits;

II. PREPARING PLAN FOR EROSION, SEDIMENT, AND STORMWATER CONTROL

An erosion, sediment, and stormwater control plan will reduce soil loss and properly manage water runoff. It will also aid individuals in complying with local, state and federal regulations dealing with the control of nonpoint source (NPS) pollution. The plan should include a listing of the most effective and practical best management practices (BMPs) designed to minimize pollution resulting from stormwater runoff and off-site sediment deposition during land disturbance activities.

An erosion, sediment, and stormwater control plan should include the following:

- 1. A brief narrative.
- 2. Planned BMPs (structural and vegetative practices).
- 3. An operation and maintenance plan for BMPs.
- 4. Drawings and specifications of BMPs.
- 5. A vicinity U.S. Geological Survey (USGS) geological quadrangle map.
- 6. A site topographic map.
- 7. A site development map.
- 8. A site erosion, sediment, and stormwater control map.
- 9. Name, address, and telephone number of the parties responsible for developing and implementing the plan.
- 10. Continuing education of all employees to inform them of plan requirements.

The specific number of maps, practices, drawings, specifications, and calculations required depends on the size and complexity of the land disturbing activity. The plan should be organized and presented in a clear, concise manner with sufficient design and background information included to facilitate review by NPS pollution control and other reviewing personnel. In general, an acceptable erosion, sediment, and stormwater control plan (Sample Plan, Appendix A) should contain as a minimum:

1. A brief narrative to include:
 - a. Project description (purpose, size of area to be disturbed, and location).
 - b. Before and after site description (topography, principal drainageway for the site, land cover condition, percent of impervious area, and the associated increase of runoff volume from a 25-year 24-hour storm event).
 - c. Adjacent property. (This should include the identification of land use and cover conditions).
 - d. Soils description.
2. Planned Best Management Practices to include:
 - a. Beginning and completion of date of construction activities.
 - b. A sequence of all construction-related BMP and vegetative activities. Include any winter shut-downs.
 - c. Preconstruction conference with planners and contractors is recommended and should be scheduled one week prior to land disturbance to orientate contractors to the erosion, sediment, and stormwater control plan.
 - d. A listing of erosion and sediment control BMPs to minimize pollution during construction along with location and installation schedule for each.
 - e. A listing of stormwater pollution control and groundwater protection BMPs to minimize pollution after construction has ended along with location and installation schedule for each.
3. Operation and Maintenance (O&M) plan for BMPs.
 - a. Temporary measures: a plan for the schedule of maintenance during construction along with any operational criteria.

- b. Permanent measures: a plan for the long term maintenance and operation including entities responsible, financial obligations for continued O&M, designated access for maintenance, and schedule of O&M activities.
 - c. Maintenance during and after construction may include practice reestablishment, repair, sediment removal, mowing, etc.
- 4. Drawings and specifications of BMPs with supporting calculations.
 - a. Drawings in this manual can be utilized along with standard engineering drawings of structures and measures so long as site specific elevations, dimensions, etc., are shown on drawings.
 - b. Support data and calculations should be sufficient to allow reviewers to reproduce design procedure of structures and measures. Sources of information should be cited.
 - c. One permanent benchmark will be clearly labeled on drawings if needed to plan measures. If elevations are tied to a USGS benchmark, description and elevation of benchmark will be provided.
- 5. Vicinity USGS Quad Map - This map should identify the location of:
 - a. Land disturbing activity.
 - b. Site stormwater discharge.
- 6. Site Topographic Map - This will provide preconstruction site topography while locating drains, property lines, construction work limits, and any utilities. Scale will be no less than 1"=60'. Trees to be preserved will be located on this map.
- 7. Site Development Map - This map should identify the location of buildings and associated paved areas, raw materials or finish product stockpile areas, equipment storage areas, processing areas, construction entrances, access or haul roads, and finished grades on a duplicate of the site topographic map.
- 8. Site erosion, sediment, and stormwater control map - This map should identify the location of all the BMPs (temporary and permanent) on a duplicate of the site topographic map along with the location of all permanent construction and associated paved areas and finished grades.

9. Name, address, and telephone number of the contact personnel responsible for developing and implementing the plan.
10. Continuing education plan for all employees to inform them of plan requirements.
 - a. As work progresses and various subcontractors and/or new employees are brought onto the work site, each should be familiarized by the contractor with the plan. At the beginning of each workweek, scheduled items of the plan to be implemented during that week should be brought to the attention of the impacted work force.
 - b. O&M training will assist personnel responsible for continued operation of the completed project. This should include an annual review of schedule for maintenance activities.

CHAPTER 4

TABLE OF CONTENTS

STANDARDS AND SPECIFICATIONS

I. Soil Stabilization Measures

Temporary Seeding (TS)
Permanent Seeding (PS)
Sodding (SO)
Ground Cover (GC)
Mulching - Permanent and Temporary (M)
Riprap (RR)
Construction Road Stabilization (CRS)
Construction Entrance (CE)
Land Grading (LG)
Topsoiling (T)
Dust and Pollutants Control (DPC)

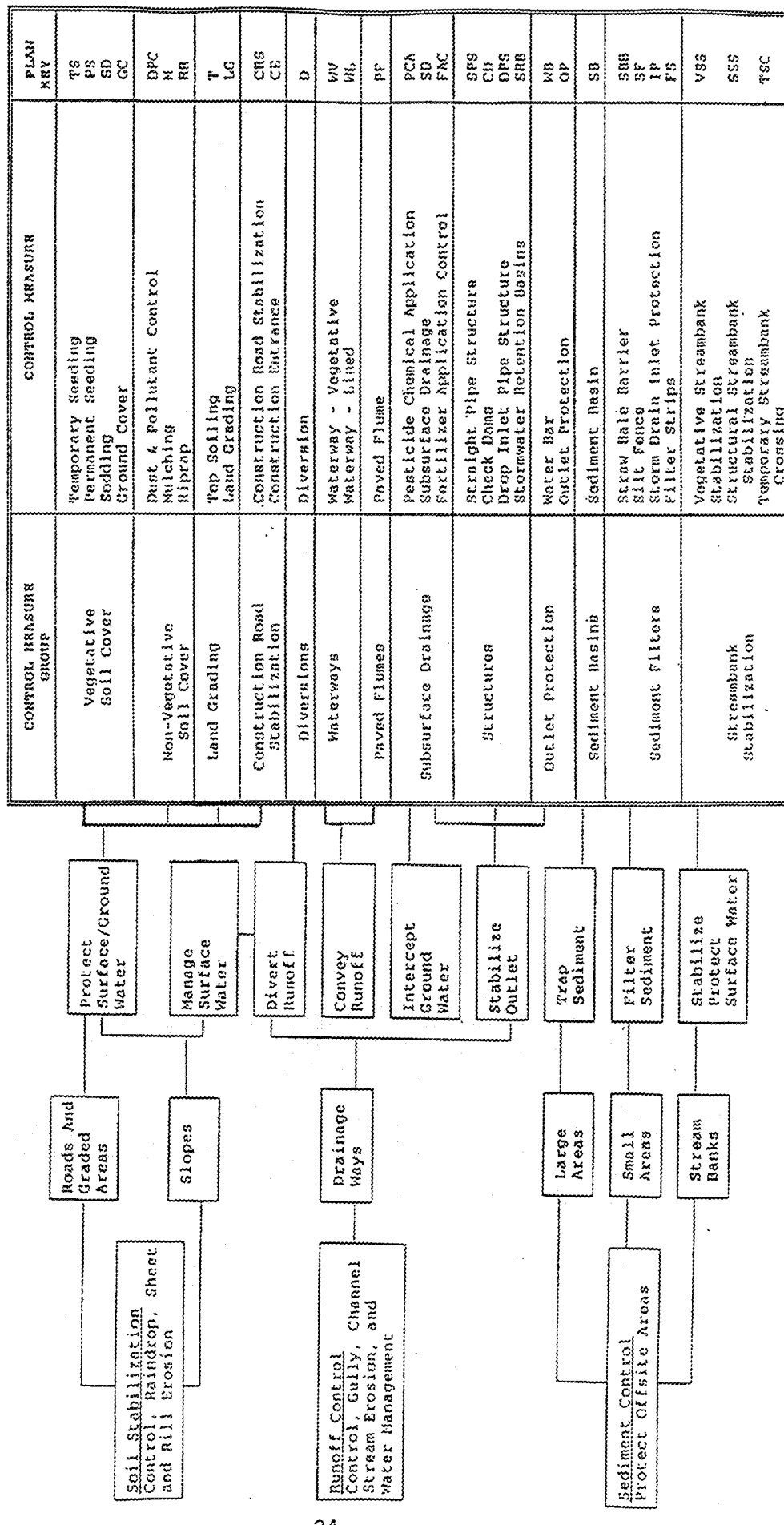
II. Runoff Control Measures

Diversions (D)
Waterways - Lined and Vegetated (WL) and (WV)
Check Dams (CD)
Subsurface Drainage (SD)
Stormwater Retention Basins (SRB)
Structures (SPS), (DPS)
Outlet Protection (OP)
Water Bar (WB)
Paved Flume (PF)
Pesticide and Chemical Application (PCA)
Fertilizer Application Control (FAC)

III. Sediment Control Measures

Sediment Basins (SB)
Straw Bale Barrier (SBB)
Silt Fence (SF)
Storm Drain Inlet Protection (IP)
Filter Strip (FS)
Vegetative Streambank Stabilization (VSS)
Structural Streambank Stabilization (SSS)
Temporary Streambank Crossing (TSC)

WATER MANAGEMENT AND SEDIMENT CONTROL BMP SELECTION PROCESS



"COST SAVING TIPS" FOR BMP SELECTION PROCESS

1. Relate the development to the site conditions, identify and map natural features, such as topography, water areas, drainageways, existing vegetation, depth to rock, floodways, etc. For instance, in site planning consider level areas for building locations and parking areas and steep areas for open space. Locate streets as nearly as possible to the contour, avoiding steep grades.
2. Minimize land grading and develop a plan to fit the existing topography, grade only where necessary. Schedule land-disturbing activities and grade only the smallest practical land area at one time to reduce erosion potential.
3. Integrate surface and stormwater drainage systems to plan for safe disposal of the increased runoff. Keep runoff velocities low; temporarily retain excess runoff on the site to reduce the sediment load.
4. Retain as much existing vegetation as possible, in particular, leave natural buffer zones adjacent to streams, on steep slopes and on other critical erosion areas.
5. Temporary Vegetation should be seeded on disturbed areas if construction is not completed in a short period of time. Annual plants germinate quickly, slow runoff and reduce erosion.
6. Revegetate permanently after final grading and as soon as practical. A dense vegetative cover is the most efficient erosion control.
7. Schedule grading operations and other development activities to reduce time of land exposure. Only grade areas that will be developed immediately.
8. Install diversions, waterways, sediment basins and/or other BMPs beforehand, when removal of vegetation and land grading is necessary or unavoidable.

These erosion and sediment control principles can often prevent a large portion of potential soil loss from the development site and reduce stormwater runoff. As more of these principles are applied, fewer structural BMPs are needed and out-of-pocket costs are reduced.

WATER MANAGEMENT, EROSION AND
SEDIMENT CONTROL FOR CONSTRUCTION AREAS
TECHNICAL STANDARD AND SPECIFICATIONS

Temporary Seeding (TS)

Definition

The establishment of a temporary vegetative cover on disturbed areas by seeding with the appropriate rapid growing plants.

Purposes

1. To reduce the erosion and sedimentation by stabilizing disturbed areas that will not be brought to final grade for a year or less.
2. To reduce problems associated with mud or dust from bare soil surfaces during construction.
3. To reduce sediment runoff to downstream areas and/or groundwater basins and improve the visual resources of the construction area.

Conditions Where Practice Applies

On exposed soil surfaces where additional work (grading, etc.) is not scheduled for a period of three weeks to less than one year.

Planning Considerations

1. Protect the area from excess runoff as necessary with diversions, terraces, or sediment basins.
2. Evaluate the capabilities and limitations of the soil to be seeded. Special attention needs to be given to soil Ph, texture, internal water movement, steepness, and stability in order to plan the appropriate treatment.
3. Plant species should be selected on the basis of quick germination, growth, and time of year to be seeded.
4. Fertilizer, lime, seedbed preparation, seed coverage, mulch, and irrigation should be used as necessary to promote quick plant growth.

WATER MANAGEMENT, EROSION AND
SEDIMENT CONTROL FOR CONSTRUCTION AREAS

Temporary Seeding (Cont'd)

SPECIFICATIONS

I. Site Preparation

- A. Grade as needed and feasible to permit the use of conventional equipment for seedbed preparation, seeding, mulch application, and anchoring.
- B. Install the needed erosion control practices prior to seeding such as diversions, temporary waterways for diversions outlets, and sediment basins.

II. Seedbed Preparation

- A. Lime (in lieu of a soil test recommendation) on acid soil (Ph 5.5 or lower) and subsoil at rate of 150 pounds per 1,000 square feet or two tons per acre of agricultural ground limestone. For best results, make a soil test. This can reduce expense of unneeded lime and fertilizer and potential excess nutrient loss through runoff and leaching.
- B. Fertilizer (in lieu of a soil test recommendation) shall be applied at a rate of 28 lbs. per 1,000 square feet or 1,200 lbs. per acre of 10-10-10 analysis or equivalent.
- C. Work the lime and fertilizer into the soil with a disk harrow, springtooth harrow, or similar tools to a depth of two inches. On sloping areas, the final operation shall be on the contour.

III. Seeding

A. Species Selection ^{1 & 3}

<u>March 1 to October 31</u>	<u>Per 1,000 Square Feet</u>	<u>Per Acre</u>
1. Oats	3 lbs.	4 bu.
2. Perennial Ryegrass	1 lb.	40 lbs.
3. Tall Fescue	1 lb.	40 lbs.
4. Wheat	3 lbs.	2 bu.
5. Annual Rye	3 lbs.	2 bu.

WATER MANAGEMENT, EROSION AND
SEDIMENT CONTROL FOR CONSTRUCTION AREAS

Temporary Seeding (Cont'd)

<u>November 1 to February 28</u> ²	<u>Per 1,000 Square Feet</u>	<u>Per Acre</u>
1. Annual Rye	3 lbs.	2 bu.
2. Wheat	3 lbs.	2 bu.
3. Perennial Ryegrass	1 lb.	40 lbs.
4. Tall Fescue ⁴	1 lb.	40 lbs.

- B. Apply the seed uniformly with a cyclone seeder, drill, cultipacker, seeder, or hydroseeder (slurry may include seed and fertilizer) preferably on a firm, moist seedbed. Seed no deeper than one-fourth inch to one-half inch.
- C. When feasible, except where a cultipacker type seeder is used, the seedbed should be firmed following seeding operations with a cultipacker, roller, or light drag. On sloping land, seeding operations should be on the contour wherever possible.

IV. Mulching (For complete detail reference "Mulching - Permanent and Temporary (M) ")

- A. Mulch shall be applied to protect the soil and provide a better environment for plant growth.
- B. Mulch shall consist of small grain straw (preferably wheat or rye) and shall be applied at the rate of two tons per acre or 100 pounds (two or three bales) per 1,000 square feet.
- C. Spread the mulch uniformly by hand or mechanically so the soil surface is covered. Following application, the mulch shall be anchored or otherwise secured to the ground according to one of the following methods:
1. Mechanical - Use a disk, crimper, or similar type tool set straight to punch or anchor the mulch material into the soil.
 2. Mulch Tackifiers/Nettings/Emulsions - Use according to the manufacturer's recommendations. Superior method in areas of water concentration to hold mulch in place.

WATER MANAGEMENT, EROSION AND
SEDIMENT CONTROL FOR CONSTRUCTION AREAS

Temporary Seeding (Cont'd)

3. Wood Fiber - Wood fiber hydroseeder slurries may be used to tack straw mulch. This combination treatment is well suited to steep slopes and critical areas, and severe climate conditions.

V. Irrigation

If soil moisture is deficient, supply new seedlings with adequate water for plant growth until they are firmly established. This is especially true when seedlings are made late in the planting season, in abnormally dry or hot seasons, or on adverse sites.

¹ / Other seed species may be substituted; check with the local SCS office for recommendation.

² / After November 1, also apply mulch. See Standard and Specifications for Mulching.

³ / Clip or otherwise control vegetation as needed near structures to prevent the vegetation from maturing and drying for the purpose of preventing a fire hazard.

⁴ / If Tall Fescue is used as a temporary seeding this may also serve as a permanent seeding depending upon the quality of the stand.

WATER MANAGEMENT, EROSION AND
SEDIMENT CONTROL FOR CONSTRUCTION AREAS
TECHNICAL STANDARD AND SPECIFICATIONS

Permanent Seeding (PS)

Definition

The establishment of permanent vegetation on disturbed areas by planting seed.

Purpose

1. To reduce the erosion and decrease sediment yield from disturbed areas.
2. To permanently stabilize disturbed areas in a manner that is economical, adaptable to site conditions, and allows selection of the most appropriate plant materials.

Conditions Where Practice Applies

1. Disturbed areas where permanent, long-lived vegetative cover is needed to stabilize the soil.
2. Rough graded areas that will not be brought to final grade for several months or more.

Planning Considerations

1. Protect the area from excess runoff - as necessary with diversions, grassed waterways, terraces, or sediment basins.
2. Evaluate the capabilities and limitations of the soil to be seeded. Special attention needs to be given to soil Ph, texture, internal water movement, steepness, and stability in order to plan the appropriate treatment.
3. Plant species should be selected on the basis of timing of establishment, planned use of the area, and the amount or degree of maintenance that can be devoted to the area in the future.
4. Fertilizer, lime, seedbed preparation, seed coverage, mulch, and irrigation should be used as necessary to promote quick plant growth.
5. Vegetation cannot be expected to provide erosion control cover and prevent soil slippage on a soil that is not stable due to its structure, water movement, or excessive slope.

WATER MANAGEMENT, EROSION AND
SEDIMENT CONTROL FOR CONSTRUCTION AREAS

Permanent Seeding (Cont'd)

SPECIFICATIONS

I. Site Preparation

- A. Soil material should be capable of supporting permanent vegetation and have at least 25 percent silt and clay to provide an adequate amount of moisture holding capacity. An excessive amount of porous sand will not consistently provide sufficient moisture for good growth regardless of other soil factors.
- B. Where compacted soils occur, they should be broken up sufficiently to create a favorable rooting depth of 6-8 inches.
- C. Stockpile topsoil to apply to sites that are otherwise unsuited for establishing vegetation.
- D. Grade as needed and feasible to permit the use of conventional equipment for seedbed preparation, seeding, mulch application and anchoring, and maintenance. After the grading operation, spread topsoil where needed.
- E. Install the needed erosion control practices such as diversions, grassed waterways, and sediment basins.

II. Seedbed Preparation

- A. Lime (in lieu of a soil test recommendation) on acid soil and subsoil, 150 pounds per 1,000 square feet or three tons per acre of agricultural ground limestone. For best results, make a soil test. This can reduce expense of unneeded lime and fertilizer and potential excess nutrient loss through runoff and leaching.
- B. Fertilizer (in lieu of a soil test recommendation) apply 28 pounds per 1,000 square feet or 1,200 pounds per acre of 10-10-10 analysis. For best results, make a soil test.
- C. Work the lime and fertilizer into the soil with a disk harrow, springtooth harrow, or other suitable field equipment to a depth of 4 inches. On sloping land, the final operation shall be on the contour.

WATER MANAGEMENT, EROSION AND
SEDIMENT CONTROL FOR CONSTRUCTION AREAS

Permanent Seeding (Cont'd)

III. Seeding

A. Select a species or mixture appropriate for the site.

1. Permanent Seeding

<u>Kind of Seed¹</u>	<u>Seeding Dates²</u>	<u>Per 1,000 Sq. Ft.</u>	<u>Per Acre</u>
a) Creeping Red Fescue, PLUS Domestic Ryegrass PLUS Kentucky Bluegrass	March-May 15 Aug.-Oct. 15	1/2 lb. 1/4 lb.	20 lbs. 10 lbs.
b) Tall Fescue	March-May 15 Aug.-Oct. 15	1 lb. ³	40 lbs.
c) Dwarf (Turf-type) Fescue ⁴	March-May 15 Aug.-Oct. 15	1 lb. ³	40 lbs.

2. Special Seedings - Steep Banks or Cuts

<u>Kind of Seed¹</u>	<u>Seeding Dates²</u>	<u>Per 1000 Sq. Ft.</u>	<u>Per Acre</u>
a) Tall Fescue	March-May 15 Aug.-Oct. 15	1 lb.	40 lbs.
b) Crownvetch PLUS Tall Fescue	March-May 15 Aug.-Sept. 15	1/4 lb. 2/3 lb.	10 lbs. 30 lbs.
c) Flatpea PLUS Tall Fescue	March-May 15 Aug.-Sept 15	2/3 lb. 1/2 lb.	30 lbs. 20 lbs.

3. Waterways and Road Ditches

a) Tall Fescue	March-May 15 Aug.-Oct. 15	1 lb.	40 lbs.
----------------	------------------------------	-------	---------

IV. Mulching (for complete detail reference "Mulching - Permanent and Temporary (M)")

A. Mulch shall be applied to protect the soil and provide a better environment for plant growth.